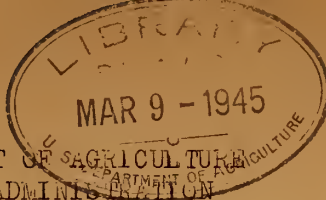


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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH ADMINISTRATION
BUREAU OF AGRICULTURAL AND INDUSTRIAL CHEMISTRY

The American Cassina Plant as the Source of A Table Beverage*

Introduction

Diminishing supplies of coffee and tea, resulting from wartime interruption of international trade, have revived interest in the native cassina plant as a possible source of a table beverage. About 20 years ago scientists in the Bureau of Chemistry investigated the cassina plant and experimented on methods for curing cassina leaves and preparing from them beverages and a flavoring extract.

History of Cassina

The plant *Ilex cassine* (Walter) or *Ilex vomitoria* (Alton) is known under the common names of yaupon, cassina, and Christmas-berry tree.

In Colonial days the leaves of the cassina plant were cured in a crude way by the American Indians, who produced from them a beverage which they used as a stimulant much as we use tea and coffee. The Indians also prepared a beverage from these leaves to be used in connection with their religious ceremonies. The South American Indians used another species of *Ilex* for the same purpose. This South American species, technically known as *Ilex paraguayensis*, and commonly called yerba mate, has been extensively commercialized in some of the South American countries, especially in Brazil, Paraguay, Uruguay and Argentina. In Argentina alone 165,000,000 pounds were produced in 1942, while in 1941 Paraguay produced 31,683,029 pounds.

Cassina, the North American species, has been cured in a crude way and is still being used to some extent in North Carolina and Virginia. During the War between the States, when tea and coffee were not available to the people of the South, the crudely cured cassina leaves were extensively used by southern families and by the Confederate Army for preparing a stimulating beverage.

Cassina, like tea and coffee and yerba mate was discovered and used for centuries before scientific research showed that the stimulant or active principle of all these plant products is caffeine. The amounts of caffeine in tea and coffee vary with the variety and method of curing, the averages approximating 1.2% in roasted coffee and 2.46% in tea. Samples of cassina analyzed in the Bureau had an average caffeine content of 0.84%.

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In 1921 the Bureau carried on laboratory experiments in the scientific curing of cassina leaves to determine whether or not a beverage-producing product that was both palatable and capable of being used in the same manner as tea and coffee, could be made. The experiments proved that this could be done, and the Bureau undertook to demonstrate on a commercial scale the utility of the plant for this purpose. During the summer of 1922 there was established at Mt. Pleasant, South Carolina, in cooperation with Mr. Alfred Jouannet, an experimental commercial factory. Mr. Jouannet's plantation was selected because he had, growing on his place, large cassina hedges which afforded ample material easily accessible.

About 7,000 pounds of cassina of three different kinds, namely, green cassina, black cassina, and cassina mate, were produced by different methods of manufacture. The experiments showed that these products could be produced very cheaply in comparison with commercial tea because (1) unlike tea, all the leaves on the plant contain the active principle, caffeine, (2) unlike tea, all the leaves can be removed from the pruned branches by means of live steam (3) the number of steps in the process of production can be substantially reduced, and (4) in the preparation of cassina very little hand labor is necessary.

Distribution of the Cassina Plant

Cassina grows naturally and luxuriantly on poor, sandy soils over an area of about 40,000 square miles, extending from the James River in Virginia, and following the coast of all the Southern and Gulf States to the Rio Grande River.

Although the leaves can be gathered from the wild plants and successfully manufactured into a beverage-producing product, it is believed that for commercial purposes the cassina should be cultivated so that it may be handled to better advantage. As the Bureau was interested only in the utilization of the plant, no experiments were conducted on the methods of propagation or cultivation.

Uses of Cured Cassina Leaves for Beverages

Cassina leaves when cured by the processes worked out in the Bureau may be used to make a beverage to be served like tea or coffee, or to make a sirup or extract that can be used for flavoring soda-fountain and bottled-carbonated drinks. (The cured cassina leaves may be treated like tea to make a table beverage.)

About 30 gallons of hot cassina beverage were served each day for 14 days during the Charleston South Carolina County Fair in 1922. The demand indicated very promising commercial possibilities for this beverage.

Most of the 7,000 pounds of cassina manufactured during the course of the experiment was placed on the market in half-pound containers to further test the commercial possibilities of the product.

(Apparently the established customs of using tea and coffee and the abundance and moderate prices of these commodities limited the demand and prevented the development of a market for a competitive product at that time.)

Curing Cassina Leaves

Preparation of green cassina: Twigs clipped from cassina bushes should be loosely packed in a closed vessel or compartment and exposed to live steam for about 15 minutes. Most of the leaves will drop off and the remaining leaves can be easily removed by shaking or beating. The freshly steamed leaves should be subjected to a high pressure to crush them thoroughly. This may be accomplished by passing the leaves through a tea-rolling machine. After thorough crushing, the mass should be dried with artificial heat under conditions that will avoid burning or serious scorching. A tea-drying machine or other suitable dehydrating equipment may be used. After drying, the product may be coarsely or finely ground, as desired. It should be kept in containers that prevent absorption of moisture from the air.

If the steamed and crushed leaves are dried at a relatively low temperature (about 175° F.) and, after pulverizing, are stored for several months in closed containers, they will yield a beverage having a different flavor from that obtained with leaves dried at a higher temperature.

Preparation of black cassina: Cassina leaves which have been subjected to live steam for about 15 minutes, and cooled, should be thoroughly mixed with about 1/4 to 1/2 their weight of fresh finely ground, green cassina leaves that have not been steamed. The mixture should be subjected to a high pressure, by means of a tea-rolling machine or other device, to completely crush the leaf tissue, and then be exposed in a moderately thin layer (from 1 to 3 inches) to moist air in a cool place for several hours, or overnight, to permit the natural enzyme fermentation to take place. The mass should then be dried with artificial heat in suitable dehydrating equipment under conditions that will avoid scorching. After the product is dried and broken up or ground to the desired degree of fineness, it should be packed in containers that prevent absorption of moisture from the air.

The enzyme fermentation results in a desirable chemical change in the composition of the leaves and changes the flavor of their infusion. The accomplishment of this change may be recognized by a faint characteristic odor of the moist, fermented mass, that one learns to recognize from experience.

